



## NECA/BICSI 607-2011

Standard for

# Telecommunications Bonding and Grounding Planning and Installation Methods for Commercial Buildings

AN AMERICAN NATIONAL STANDARD



Published by  
National Electrical Contractors Association



Jointly developed with  
BICSI®

Currently in preview, click buy full version

NECA/BICSI 607-2011

Standard for

# Telecommunications Bonding and Grounding Planning and Installation Methods for Commercial Buildings

An American  
National Standard



Published by  
National Electrical  
Contractors Association



Developed jointly with  
BICSI®



# Table of Contents

Foreword	v
<b>1. Scope</b>	<b>1</b>
<b>2. Normative references</b>	<b>2</b>
<b>3. Definitions, abbreviations and acronyms, units of measurement</b>	<b>3</b>
3.1 General	3
3.2 Definitions	3
3.3 Abbreviations and acronyms	4
3.4 Units of measurement	4
<b>4. Regulatory</b>	<b>5</b>
4.1 National requirements	5
4.2 Local code requirements	5
<b>5. Components</b>	<b>6</b>
5.1 Conductor	6
5.2 Busbar	6
5.2.1 Telecommunications main grounding busbar (TMGB)	6
5.2.2 Telecommunications grounding busbar (TGB)	6
5.3 Bonding connector	6
5.3.1 Compression	6
5.3.2 Mechanical	6
5.3.3 Exothermic	7
<b>6. Planning</b>	<b>8</b>
6.1 General	8
6.1.1 Bonding to the electrical power system	8
6.1.2 Primary protector	8
6.2 Bonding conductor	8
6.2.1 General	8
6.2.2 Size	8
6.2.3 Usage	8
6.3 Busbar	9
6.3.1 Telecommunications main grounding busbar (TMGB)	9
6.3.2 Telecommunications grounding busbar (TGB)	9
6.4 Bonding connections	9
6.5 Connections to the TMGB/TGB	10
6.5.1 Electrical distribution panel (EDP)	10
6.5.2 Building steel	10
6.5.3 Conduit	10
6.5.4 Telecommunications equipment bonding conductor (TEBC)	10

**NECA/BICSI 607 Telecommunications Bonding and Grounding Planning and Installation  
Methods for Commercial Buildings**

6.6	Bonding equipment, racks and cabinets	10
6.6.1	General	10
6.6.2	Example A	11
6.6.3	Example B	11
6.6.4	Example C	11
6.6.5	Rack isolation	12
<b>7.</b>	<b>Installation requirements</b>	<b>13</b>
7.1	General	13
7.1.1	Safety	13
7.1.2	Bonding to the electrical power system	13
7.1.3	Primary protector	13
7.1.4	Equipment room (ER)	13
7.1.5	Telecommunication room (TR)	13
7.1.6	Backbone cables with shields	13
7.2	Bonding conductors	13
7.3	Bonding connections	14
7.4	Telecommunications main grounding busbar/telecommunication grounding busbar TMGB/TGB	14
7.4.1	Installation of the TMGB/TGB	14
7.4.2	Connections between a TMGB/TGB and an EDP	14
7.5	Bonding the TBB, GE, TEBC, UBC, or RBC to the TMGB or the TGB	14
7.5.1	General	14
7.5.2	Installation	15
7.6	Routing the tebc from the TMGB/TGB to the rack/cabinet	18
7.6.1	General	18
7.6.2	Bends	19
7.6.3	Separation	19
7.7	Bonding equipment cabinets/equipment racks to the TEBC	19
7.7.1	Structural bonding of equipment cabinets/equipment racks	20
7.8	Bonding equipment to the rack bonding conductor or rack grounding busbars	20
7.9	Bonding cable runways and cable trays	20
7.9.1	General	20
7.9.2	Installation	22
7.10	Ancillary bonding	22
7.11	Two-point ground/continuity testing	22
7.12	Inspection	23
<b>Annex A:</b>	<b>Bibliography and references (informative)</b>	<b>24</b>

(This foreword is not a part of the standard)

# Foreword

## Introduction

*National Electrical Installation Standards™ (NEIS)* are designed to improve communication among specifiers, purchasers, and suppliers of electrical construction services. They define a minimum baseline of quality and workmanship for installing electrical products and systems. NEIS are intended to be referenced in contract documents for electrical construction projects. The following language is recommended:

Telecommunications bonding and grounding planning and installations shall be installed in accordance with NECA/BICSI 607-2011, *Standard for Bonding and Grounding Planning and Installation Methods for Commercial Buildings*.

The National Electrical Contractors Association (NECA) asked BICSI®, a Telecommunications Association, together undertook the task of developing this grounding and bonding standard for telecommunications systems and equipment.

NECA-BICSI standards are developed within the Technical Committees of BICSI and NECA. Members of the respective committees serve voluntarily and without compensation. The companies they represent are not necessarily members of BICSI or NECA. The standards developed by these committees represent a consensus of the broad expertise from within BICSI and NECA as well as from those outside that have an expressed interest. The viewpoint expressed at the time this standard was approved was from the contributors' experience and the state of the industry at that time. Users are encouraged to confirm that they have the latest edition of this standard. NECA-BICSI reviews its standards, at the minimum, every 5 years. At that time standards are reaffirmed, rescinded or revised accordingly. Any suggested revisions to

be included in the next edition should be sent to NECA or BICSI.

This standard has been prepared by BICSI/NECA under the joint jurisdiction of BICSI and NECA and approved by consensus ballot in accordance with the requirements of the American National Standards Association (ANSI). Use of NEIS is voluntary, and neither NECA nor BICSI assume any obligation or liability to users of this publication. Existence of a standard has not preclude any member or non-member of either organization from specifying or using alternate construction methods permitted by applicable regulations. This publication is intended to comply with the edition of the *National Electrical Code® (NEC®)* in effect at the time of publication. Because they are quality standards, NEIS may exceed the minimum safety requirements of the NEC. It is the responsibility of users of this publication to comply with state and local regulations when installing electrical products and systems.

Suggestions for revisions and improvements to this standard should be addressed to:

NECA Standards & Safety  
3 Bethesda Metro Center, Suite 1100  
Bethesda, MD 20814  
(301) 657-3110 telephone  
(301) 215-4500 fax

Personnel safety and protection of susceptible electronic equipment from ground faults, lightning, ground potential rise, and electrical surges is of the utmost importance at telecommunications facilities.

Cloud to ground lightning discharges must find a path to ground; either discharging directly to the ground itself or to structures in contact with ground.

Electrical transients must return to their source, many times following similar ground paths. In either event, proper bonding reduces the harmful effects associated with these electrical events.

Metallic components for power distribution systems are bonded together to provide an effective ground-fault current path to allow proper operation of over-current devices. For telecommunications systems, metallic components are bonded to provide a low impedance path for electrical surges and transient voltages to return to their power source. The earth is also involved as a path for grounded (earthed) power systems and for lightning events. Lightning, fault currents, circuit switching (motors starting and stopping), and electrostatic discharge (ESD) are common causes of surges and transient voltages. An effective bonding and grounding system helps to minimize the damaging effects of electrical surges.

Proper bonding and grounding of electrical and information transport systems (ITS) infrastructure facilitates their intended operation. Improperly bonded and grounded electrical systems are a primary cause of power quality issues, which may affect information technology (IT) systems operation.

Other performance items related to bonding and grounding for telecommunications within a building involve power systems, surge protective devices, and electromagnetic compatibility (EMC). IEEE 1100-2005 contains recommended practices for these and related subjects.

## **Purpose**

The purpose of this standard is to allow the designer and installer to enhance their knowledge of effective telecommunications bonding and grounding systems and to strive for installations in a neat and workman-like manner. The principles and requirements of this standard are focused upon the North American region.

## **Specification of criteria**

Two categories of criteria are specified; mandatory and advisory. The mandatory requirements are designated by the word "shall": advisory recommendations are

designated by the words "should", "may", or "desirable", which are used interchangeably in this standard.

Mandatory criteria generally apply to protection, performance, administration, and compatibility; they specify the absolute minimum acceptable requirements. Advisory or desirable criteria are presented when their attainment would enhance the general performance of the cabling system in all its content-related applications. A note in the text, table, or figure is used for emphasis or offering informative suggestions.

## **Metric equivalents of U.S. customary units**

The majority of the metric dimensions in this standard are soft conversions of U.S. customary units (e.g., 100 millimeters [mm] is the soft conversion of 4 inches [in]). Wire diameters shown in brackets [ ] are approximate wire diameters (e.g., 6 AWG [(4.1 mm (0.16 in.))]).

## **Life of the standard**

This standard is a living document. The criteria contained in this standard are subject to revisions and updating as warranted by advances in building construction techniques and telecommunications technology.

## **Annexes**

Annex A is informative and not considered a requirement of this standard.

Copyright © 2011, National Electrical Contractors Association. All rights reserved. Unauthorized reproduction prohibited.

*National Electrical Installation Standards* and *NEIS* are trademarks of the National Electrical Contractors Association. BICSI is a registered trademark of BICSI—A Telecommunications Association, Tampa, FL. National Electrical Code and NEC are registered trademarks of the National Fire Protection Association, Quincy, MA.

*Photos and art provided by BICSI.*

# 1. Scope

This American National Standard specifies aspects of planning and installation of telecommunications bonding and grounding systems within a commercial building (see figure 1). This standard is intended to enhance the planning, specification and layout of an effective telecommunications bonding and grounding system. Additionally, this standard specifies installation requirements for components of the telecommunications bonding and grounding system.

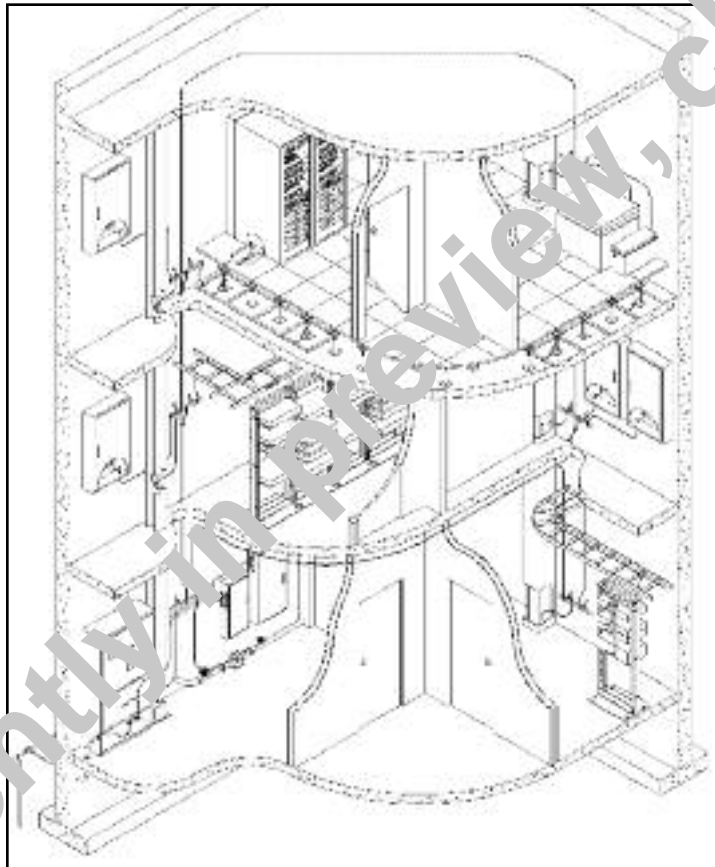


Figure 1. Example illustration of a telecommunications bonding and grounding system

## 2. Normative References

The following standards and related applicable addenda contain provisions that, through reference in this text, constitute provisions of this standard:

- IEEE C2-2007, *National Electrical Safety Code*<sup>®</sup>
- ANSI/J-STD-607-A-2002, *Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications*
- NFPA 70<sup>™</sup>-2011, *National Electrical Code*
- NFPA 70E<sup>®</sup>-2004, *Standard for Electrical Safety in the Workplace*

At the time of publication, the editions listed above were current. As standards are subject to revision, users of this standard are encouraged to review and apply the latest published edition.